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PATENT & TRADEMARK OFFICE

2819

Attorney's Docket No.: 12173-002001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : John M. Amaral, et al. Art Unit : 2819
Serial No. : 09/814,453 Examiner : Not Yet Assigned
Filed : March 22, 2001
Title : TRANSMITTING DATA PACKETS RECEIVED FROM A NON-CONSTANT DELAY NETWORK

Commissioner for Patents
Washington, D.C. 20231

PETITION TO MAKE SPECIAL UNDER 37 C.F.R. §1.102

Applicants hereby petition to make the subject application "special" under 37 C.F.R. §1.102. In accordance with MPEP §708.02(VIII), Applicants aver the following:

Statement That Application Claims Single Invention

The application includes twenty-six (26) claims, four of which are independent. The four independent claims include a method claim (claim 1), two apparatus claims (claims 13 and 25), and a computer program claim (claim 26). Each of these claims includes variants of the following features:

storing data packets in a buffer;
determining a play-out schedule for the data packets based on timing information in the data packets; and
transmitting the data packets from the buffer in accordance with the play-out schedule

The claims of the application are thus directed to a single invention.

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CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D.C. 20231.

February 21, 2003
Date of Deposit

Signature

Joanne Mecherkany
Typed or Printed Name of Person Signing Certificate

Statement Regarding Pre-Examination Searches

Two pre-examination searches were conducted.

The first pre-examination search was conducted in corresponding PCT Application No. PCT/US01/09861. The United States Patent and Trademark Office conducted the search acting as the International Searching Authority. Copies of the search report dated August 24, 2001 and the reference cited therein were submitted in an Information Disclosure Statement dated October 12, 2001. Additional copies of the search report and cited reference are enclosed herewith. The search was conducted in the following U.S. classes/subclasses: class 370, subclasses 350, 519, 411-418; and class 709, subclasses 231, 205, 207.

The second pre-examination search was conducted by an outside search firm. The references that turned-up in this search are enclosed. Also enclosed is a Form PTO-1449, which lists those references. The Examiner is respectfully requested to initial and return the enclosed Form PTO-1449 to indicate that the references listed thereon have been considered and made of record. The second pre-examination search was conducted in the following U.S. classes/subclasses: class 370, subclasses 395.1, 396, 508, 516, 517, 519; class 380, subclass 217; and class 725, subclasses 87, 89, 91, 92, 94, 95.

Detailed Discussion Of References

The following Patents turned-up in the two pre-examination searches: 5,467,342 (Logston), 5,640,338 (Woodhead), 5,699,387 (Cloutier), 6,262,776 (Griffits), 6,360,271 (Shuster), 6,377,588 (Osaki), and 6,195,701 (Kaiserworth) (the U.S. equivalent of WO 95/25313

also submitted). Applicants contend that these references, whether taken individually or in combination, do not disclose or suggest the above features of the claims, particularly with respect to determining a play-out schedule for data packets based on timing information in the data packets and transmitting the data packets from a buffer in accordance with the play-out schedule.

In this regard, Logston describes modifying program clock references (PCRs) in order to reduce jitter through an asynchronous transfer mode (ATM) network (see, e.g., column 11, lines 14 to 26 of Logston). The description of buffering provided in Logston is in connection with the prior art shown in Fig. 2. Data from those buffers 48 and 54, however, is not read out in accordance with a play-out schedule in the manner set forth in the claims.

Woodhead describes a de-jittering device that de-jitters data packets by modifying PCRs in the packets. In the course of its operation, the device stores packets in a buffer and reads the packets out of the buffer in accordance with the difference (α) between encoder and decoder clocks. Referring to Fig. 5 of Woodhead, the device stores a nominal transmission bit rate in rate cell 130. Rate cell 130 counts down to a nominal value, which causes LLMP 128 to output a packet from buffer 122 to output control logic 124, which adjusts the PCR of the packet to reduce jitter (see, e.g., column 13, lines 47 to 52 of Woodhead). Packet transmit time through the buffer is measured by taking two snapshots of local clock 132. The transit time is used to calculate α, which is used by RCP 126 to adjust the value in rate cell 130 which controls output of the packets via LLMP 129 (see, e.g., col. 13, lines 38 et seq. and col. 18, lines 52 et seq. of Woodhead). Thus, while packet readout from a buffer is controlled, no scheduling is performed.

Cloutier determines jitter by determining the difference between expected and actual arrival times of data packets. Jitter is removed from the data stream either by adjusting the

output data rate of a buffer 144 (Fig. 2) containing MPEG data packets or by rewriting PCR values in the data packets (see, e.g., column 11, lines 34 to 48 and column 13, lines 29 et seq. of Cloutier). Again, no scheduling is performed in the Cloutier system.

Griffits describes synchronizing digital audio and video data. Griffits does this by determining an offset time, which corresponds to a time difference between the audio and video data, and displaying the video data in accordance with the offset time. Griffits, however, does not determine a playout schedule based on timing information in data packets and transmit the data packets from a buffer in accordance with the play-out schedule.

Shuster includes a jitter buffer 34 (Fig. 2) that delays packets to compensate for delays in network. Shuster requires knowledge of the total end-to-end transmission time and configures jitter buffer 34 to delay packet play-out for some time based on an estimate of a one-way network transmission delay between a transmitter and a receiver (see, e.g., column 10, lines 13 et seq. of Shuster). Shuster, however, does not determine a play-out schedule for the data packets based on timing information in the data packets.

Osaki describes a system for reducing jitter in MPEG data over an ATM network by modifying PCRs (see, e.g., col. 2, lines 36 et seq. of Osaki). Nowhere does Osaki disclose or suggest determining a play-out schedule for the data packets based on timing information in the data packets, much less reading those packets from a buffer based on the play-out schedule.

Kaiserworth describes synchronizing playout of different data streams from different data units in accordance with trigger conditions, e.g., if both data units are ready to output their data (see, e.g., col. 3, lines 11, et seq. of Kaiserworth). Data from the different data streams may be stored, e.g., in buffers 19 and 20 (col. 3, lines 42 et seq.) and played out therefrom via playout

device 21. Scheduling is referred to in column 2, line 48 of Kaiserworth. Scheduling, in this context, however, refers to scheduling of real-time tasks and their interaction with time-sensitive data traversing the system. Scheduling is the means by which real-time data is synchronized with the real-time tasks such that operations performed on the time-sensitive data can be performed expediently so as to not disrupt the essence of the information. Kaiserworth, however, does not determine a playout schedule based on timing information in data packets and transmit the data packets from a buffer in accordance with the play-out schedule.

Conclusion

In view of the foregoing, Applicants respectfully request grant of this Petition and early examination and allowance of the subject application.

A check in the amount of $130.00 is enclosed to cover the fee for this Petition under 37 C.F.R. §1.17(h). Please apply any deficiencies in the enclosed fees to Deposit Account No. 06-1050.

Applicants' undersigned attorney can be reached at the address shown below. All correspondence should be directed to the undersigned at that address.

Respectfully submitted,

Date: February 21, 2003

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